

EXECUTIVE SUMMARY

FOR

**DEVELOPMENT OF GREENFIELD PETROLEUM STORAGE
DEPOT
NEAR DAHEGOAN RAILWAY STATION, DISTRICT WARDHA**

SUBMITTED TO



M/s ESSAR OIL LIMITED

PREPARED BY



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1.1 Introduction

Essar Oil Limited (EOL) is a fully integrated oil and gas company of international scale with strong presence across the hydrocarbon value chain from exploration and production to refining and oil retail. EOL owns India’s second largest single site refinery having a capacity of 20 MMTPA and complexity of 11.8, which is amongst the highest globally. It has a portfolio of onshore and offshore oil and gas blocks with about 1.7 billion barrels of oil equivalent in reserves and resources. There are more than 1,600 Essar-branded oil retail outlets in various parts of India and EOL is

- a) First private company in India to enter refined products marketing sector and has 1600 ROs operational.
- b) Supply bulk products to traders and direct customers.
- c) Tie-ups with other oil marketing companies that gives Essar Oil access to product and right to use their Depots and facilities for placing and marketing its products. This gives the company pan-India presence with more than 30 supply locations.
- d) Marketing of petroleum products to SAARC countries

EOL Vadinar Refinery is one of the most versatile Refineries in India. With successful implementation of various projects and de-bottle necking of the Refinery, it currently processes about 20 MMTPA and is enhancing the marketing network ever, since the petroleum products price decontrol. Petroleum products’ depots are required to meet the ever growing demand.

1.2 Project Description

EOL Marketing Division has proposed to set up a new Petroleum and Oil (POL) Depot (Rail-fed) at Village Neemgaon, District – Wardha, Maharashtra. The proposed depot shall fully comply with PESO, OISD guidelines mainly 117, 118 and 244 and Local Statutory requirements. No inter linked and interdependent projects are involved. Proponents have proposed to construct within the area of 2,02,343 m² (20.2 ha) already owned by EOL. Details of product wise tankage at Wardha Depot are given in **Table 1.1**.

Table 1.1: Proposed Schedule of Tanks

SN	Tank No.	Φ & h, m	Product	Type of Tank	Capacity, m ³	Class
1	TK-1001	16x12.5	MS	IFVRT	2000	A
2	TK-1002	16x12.5	MS	IFRVT	2000	A
3	TK-1003	16x12.5	MS	IFVRT	2000	A
4	TK-1004	3x10.5LG	MS	UG.HOR	70	A
5	TK-1005, 6, 7 (Future Expansion)	16x12.5	MS	IFRVT	2000	A
6	TK-2001	20x14	HSD	CRVT	4000	B

7	TK-2002	20x14	HSD	CRVT	4000	B
8	TK-2003	20x14	HSD	CRVT	4000	B
9	TK-2004	3x10.5	HSD	UG.HOR	70	B
10	TK-2005, 6, 7 (Future Expansion)	20x14	HSD/SKO	CRVT	4000	B
11	TK-3001	2.1x6.3 LG	ETHANOL	UG.HOR	20	A
12	TK-3002	2.1x6.3 LG	ETHANOL	UG.HOR	20	A
13	TK-4001	1.5x3 LG	SLOP	UG.HOR	5	-
14	TK-5001	13x15	Water	CRVT	1950	-
15	TK-5002	13x15	Water	CRVT	1950	-
16	TK-5003 (Future Expansion)	13x15	Water	CRVT	1950	-

*IFRVT – Internal Floating Roof Vertical Tank

CRVT – Cone Roof Vertical Tank

UG. HOR – UnderGround Horizontal

1.3 Technology and Process Description

There is no manufacturing process involved in the Depot. The Rail Fed POL Depot shall be handling and storing various finished petroleum products. The brief process description is as follows:

- Receiving the Product through Railway Wagons, primarily from EOL Refinery – Jamnagar (Gujarat).
- Storing the product, maintaining the quality in line with IS specifications.
- Dispatching quality petroleum products through Tank Trucks to Retail Outlets (ROs).

The entire operation of RECEIPT, STORAGE AND DISPATCH of petroleum products is carried out in a closed system thereby eliminating risk of spillage of products and to achieve enhanced safety. The process flow chart is as shown in **Figure 1.1**.

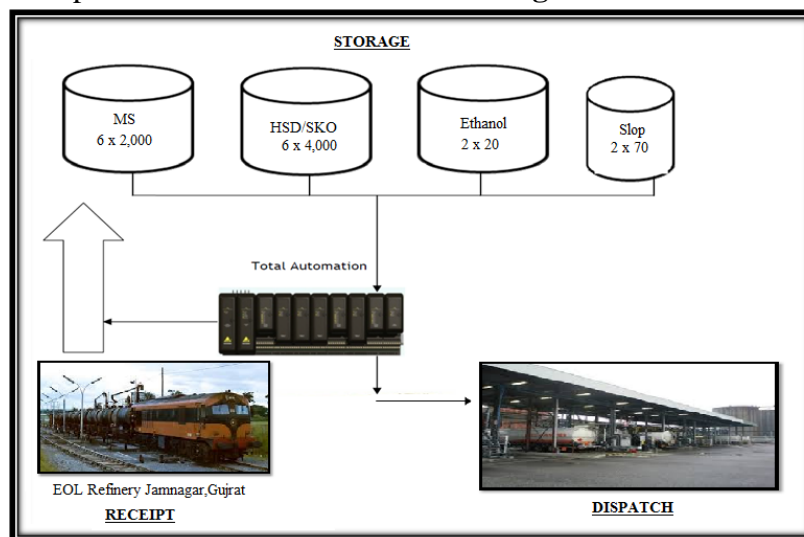


Figure 1.1: Process Flow Chart

1.3.1 TLF Sheds

There will be twelve (12) nos. of TLF bays (6 in Phase I and 6 in Phase II) for Tank Trucks loading. The loading facilities will be bottom loading for MS and HSD/SKO.

1.3.2 Product Pump House

Proposed project will have 1 TLF Pump House: 20 m X 7 m with new product pumps along with TLF Pump House Manifold: 20 m X 14 m. The details of the proposed pumps are as shown in **Table 1.2**.

Table 1.2: Schedule of Pumps

SN	Pump No	Product	Capacity (m ³ /Hr)	Head (m)	Operation	Types of Pumps	Working + Standby
1	P-1001/02	MS	500	75	Tank Filling	Centrifugal	1+1
2	P-1003/04	MS	288	50	TLF	Centrifugal	1+1
3	P-1005	MS	60	60	TLD	Centrifugal	1+0
4	P-1006/07 (Future Expansion)	MS	500	75	Tank Filling	Centrifugal	1+1
5	P-2001/02/03	HSD	500	75	Tank Filling	Centrifugal	2+1
6	P-2004/05	HSD	288	50	TLF	Centrifugal	1+1
7	P-2006	HSD	60	60	TLD	Centrifugal	1
8	P-2007/08/09 (Future Expansion)	HSD	500	75	Tank Filling	Centrifugal	2+1
9	P-3001/02	Ethanol	60	60	TLF	Submersible	1+1
10	P-4001	Slop	10	30	Slop Collection	Centrifugal	1+0
11	P-5001/02/03	Water	288	105	Diesel Engine Driven	Centrifugal	2+1
12	P-5004/05	Water	30	110	Jockey Pump	Centrifugal	1+1
13	P-5006 (Future Expansion)	Water	288	105	Diesel Engine Driven	Centrifugal	1

1.3.3 Fire Fighting Facilities

Following Fire Fighting Facilities will be provided as per OISD 244.

- Water Sprinkler system on proposed MS and HSD as per prevailing safety guidelines issued by OISD

- Foam system on proposed Diesel (HSD) and Petrol (MS) tanks as per prevailing safety guidelines issued by OISD
- Provision of Fire hydrant piping network for the new product tank farms.
- Full fledge auto-pressurized Fire Hydrant System to cover all facilities in the depot as per OISD-117/118/244 norms including Tank Truck Parking Area, as per latest Safety Norms.
- Fire Fighting Pumps with diesel engines including stand by units.
- Fire Hydrant network system with monitors and hydrant valves.
- Jockey Pumps.
- Fixed Foam discharge and sprinkler systems for vertical tanks.
- Medium Expansion Foam Generators for Dyke Area.
- Foam compound storage and delivery system.
- Remote operated HVLR variable flow water cum foam monitors fixed type or portable type as per requirement,
- Water sump and pumping facilities.
- Portable fire fighting equipment as per OISD standards.
- Two nos, Fire Water Storage tanks each of 50% of water storage requirement (Total Capacity 100% of requirement as per OISD standard).
- Any other requirement as specified in OISD 117, OISD 118 and OISD 244.

The Fire Water tanks have been provided as shown in **Table 1.3** and Schedule of Fire Pumps have been provided in **Table 1.4**. Additionally, Fire Pump House shall be provided of 30m x7 m.

Table 1.3: Details of Fire Water Tanks

SN	Product	Type of Tank	Proposed Tanks and Capacities	Total Tankages m ³	Dimater (m)	Height (m)
1	Fire Tank Water	CRVT	2 x 1950	3,900	13	15
2	Fire Tank Water (Future Expansion)	CRVT	1 x 1950	1,950	13	15

Table 1.4: Schedule of Fire Pumps

SN	Description	Capacity	Head mWC	Nos of Pumps	
				Operating	Standby
1	Jockey Pumps Electrical Driven	30 m ³ /hr	110	1	1
2	Main Pumps Deisel Engine Driven	288 m ³ /hr	105	2	1
3	Main Pumps Deisel Engine Driven (Future Expansion)	288 m ³ /hr	105	1	0

1.3.4 Dyke Wall Facility

Dyke wall shall be provided surrounding the POL tanks (above ground type). The Capacity of each tank and total maximum Capacity is highlighted below in **Table 1.5**.

Table 1.5: Dyke Wall Details

Sr. No.	Dyke Wall Containing Tanks	Max. Capacity Tank, m ³	Overall Dimension
Dyke – I	MS (3x2000)	4950	86 m x 32 m
Dyke – II	HSD (3x4000)	6350	98 m x 36 m
Dyke – III (Future Expansion)	MS (3x2000)	4950	86 m x 32 m
Dyke – IV (Future Expansion)	HSD/SKO (3x4000)	6350	98 m x 36 m

Dyke I and II shall be provided for MS and HSD respectively. For future expansion of MS and HSD/SKO, Dyke III and IV shall be provided. Dyke wall surrounding the above ground product tanks can accommodate spilled oil which is more than the maximum capacity of the largest product tank in case of leakage. Dykes are provided with adequate wall height as per OISD norms. Tank foundations are also provided with impervious membrane to avoid seepage of product if any in to ground in case of leakage from bottom plates. The tank farm flooring and dyke wall also are made impervious to prevent oil from seeping into ground.

1.3.5 Instrumentation and Automation

Automation / Instrumentation system will be as per EOL’s latest Terminal Automation System (TAS) philosophy, which includes the following, as applicable:

- Depot Automation System, Tank farm management system including Radar Gauges, Multi-Point Temperature Sensors, Pressure Transmitters, Overspill detection and audio, visual alarm system etc.
- Tank Truck loading system including, Mass Flow meters, Batch Controller, DCV etc.
- Ethanol Blending and MFA dosing systems.
- Other field equipment such as online density and temperature sensors, Field Automation and Integration of Sub system Remote Operated Shut off Valves (ROSOV’s), Motor Operated Valves (MOV’s), Double block and bleed valves (DBBV’s), Electrical sub systems, product delivery pumps, fire fighting systems. Tank Truck Entry system, bay queue display etc.
- Control Room equipment such as LRC, OIC’s, Servers, PLC’s, UPS etc. and necessary TAS software.
- Position sensors for tank dyke valves etc.
- Safety Shutdown System covering Automated Overfill Prevention System, ESD system.

- Meters proving and Calibration facilities.
- ROSOV's, MOV's, DBBV's master station, Push Button Stations etc.
- Necessary cabling, control panel, earthing etc.
- Air Compressor/Air Dryer/Air receiver and piping for pneumatic systems.
- Access control, zoning and multi zoning systems, security features like DFMD's HHMD's etc.
- CCTV system to cover total depot facilities including perimeter wall.
- Hydrocarbon detectors and flow sensors etc. near all potential leak sources of class 'A' petroleum product,
- Other automation systems and its interface of SAP system with TAS, and to ensure that engineering and design addresses the need for standardization.
- Any other requirement as specified in OISD 117, OISD 118 and OISD 244.

1.3.6 Manpower

During construction phase approximately 200-300 local labour will be employed and 34 during operational phase to include contract labour and security personnel.

1.3.7 Water Supply

Requirement for the Project will be 30 m³ for construction phase and 25 m³ for Operational phase. The water requirement is proposed to be met from proposed bore wells on-site.

1.3.8 Power Requirement

Power Requirement of the project will be fulfilled by MSEDCL, which is 2200 kW; 2 DG sets of 900 kVA capacity are envisaged to be used only during power failures and emergencies. The DG sets will each have a stack height of 6m above roof level per CPCB guidelines.

1.4 Description of Environment

The area around the proposed Terminal has been surveyed for physical features and existing environmental scenario. The field survey has been done during January to April 2016.

Meteorology:

The meteorological condition of the project site during the study period is presented in report. During study period the pre-dominant wind direction in the region is from North-North East to South-South West. The temperature varied from 6.0⁰C to 44.0⁰C, whereas, the relative humidity varied from 6% to 100%. The monthly mean wind speed was recorded 7.4 m/s.

Air Environment:

The ambient air quality is determined at 10 locations. The PM₁₀ varied from 55 to 98 µg/m³, PM_{2.5} varied from 14 to 51 µg/m³, SO₂ varied from 10 to 30 µg/m³, NO_x varied from 12 to 46

$\mu\text{g}/\text{m}^3$. Other parameters like VOCs, Heavy metals, Benzene etc. were found Below Detectable Limit (BDL). All values are within prescribed NAAQS 2009.

Noise Environment:

Noise can be defined as an unwanted sound. A total of 11 locations were identified for ambient noise monitoring in the study area. The daytime varied from 50 dB (A) Leq to 63 dB (A) Leq and night time noise varied of 36 dB (A) Leq to 45 dB (A) Leq. Both daytime noise and night time noise was within the limit.

Water Environment:

In order to establish the baseline water quality, 3 ground water and 4 surface water samples were collected and analyzed in the study area. The analysis result for ground water samples were within drinking water limit as per IS 10500: 2012. Details of analysis result are given in the EIA report.

Soil Quality:

Soil samples were collected from 6 locations in the study area and analyzed for physico-chemical characteristics. Soil quality was found to be normal. Details of analysis result are given in the EIA report.

Land Use/Land Cover of the Study Area:

Land use pattern of the study area covering 10 km radius includes water bodies, agricultural land, Fallow land, Scrub land, Open Land and Built-up Land. Details of land use /land cover classification are given in the EIA report.

Biological Environment:

The ecological study of the area has been conducted within 10 km radius of the project site in order to understand the existing status of flora and fauna to generate baseline information.

Flora: 26 species of Trees, 11 species of Shrubs, 11 species of Herbs, 6 species of Bamboos and Grasses, 3 species of Climbers were identified.

Fauna: 13 species of mammals, 4 species of Amphibians, 11 species of Reptiles, 14 species of Butterflies, 6 species of Dragonflies and Damselflies were identified.

Avifauna: 56 species were identified within the Study Area.

Socio-economic Environment:

Analysis of the demographical statistics, based on Primary Census Abstract, 2001 & field survey reveals that the study area has a total population of 43,887 in the study area. Average scheduled castes constitute about 13.20% of the total population of villages in the study area. Scheduled tribes constitute about 15.62% of the total population of villages in the study area. Average literacy rate of the study area in 2011 was 83.35% to total population. Villages in the study area have fairly good infrastructure facilities.

1.5 Anticipated Environment Impacts and Environment Management Plan

Impact on Air Environment:

No emission is envisaged during the storage & handling of petroleum products. There would be no fugitive emission during unloading and hence, no impact is envisaged. The air environment may have minimal impact due to truck movement for receipt and dispatch.

Impact on Noise Environment:

The project site is likely to have increased noise level up to 80-90 dB(A) due to the construction activity but it is likely to be insignificant, reversible and localized in nature and mainly confined to the day hours. As the proposed Depot shall be operated in closed circuit, it is envisaged that noise environment would remain unaffected during operation of the proposed facilities.

Impact on Water Environment:

Water requirement will meet from bore wells. The overall impact on water environment due to construction of proposed project is likely to be temporary, short term and insignificant. Total water requirement for the proposed project will be 25 m³/d. 10 m³/d sewage shall be disposed through STP of Sequential Batch Reactor (SBR) technology.

Impact on Land Environment:

The project area is vacant land, there are no settlements and hence the question of rehabilitation and resettlement does not arise. As the complete system shall be closed loop, no impact is envisaged on the topography during operation phase.

Impact on Biological Environment:

The probability and consequences of significant ecological impacts occurring as a result of the operation of the POL Depot are considered to be almost negligible. The risk of any leakage is almost negligible owing to stringent leak prevention technologies.

Municipal solid waste will be disposed through local bodies. Spent lube oil from D.G. set will be sold to MPCB Authorized recyclers. Hence no impact on flora and fauna is envisaged. Moreover there are no reserve forest and protected areas within 10 km radius. Greenbelt will be developed which will serve as ecosystem. There will be no effluent discharge in the water body. Thus there is no impact on the aquatic biota present in vicinity of proposed project.

Impact on Socio-economic Environment:

The construction of the proposed project is expected to provide temporary indirect employment to a good number of skilled and unskilled workers. The project will contribute to the socio-economic development of the area at the local level in turn reducing migration for employment. Hence the proposed project will have positive impact on the socio-economic environment.

1.6 Environmental Monitoring Programme

It is imperative that EOL should set up regular monitoring locations to assess the environmental health in the post period. A post study monitoring programme is important as it provides useful information on the following aspects.

- It helps to verify the predictions on environmental impacts presented in this study.
- It helps to indicate warnings of the development of any alarming environmental situations, and thus, provides opportunities for adopting appropriate control measures in advance.

1.7 Additional Studies

1.7.1 Hazard Identification and Consequence Assessment

Quantitative Risk Study has been done to determine the potential risks of major disasters having damage potential to life and property and provide a scientific basis using PHASTRISK (Version 6.7) software developed by DNV GL. Disaster Management Plan is prepared for identification of various hazards addressed qualitatively and included in onsite- emergency plan. Details of risk assessment are given in the EIA report.

Hazards were identified for release of MS, HSD, SKO and Ethanol for scenarios of catastrophic rupture of storage tank at proposed site. Consequence analysis of all possible containment scenarios was carried out. **No domino effect envisaged as all tanks are adequately spaced and heat or pressure wave is limited to dyke area.**

1.8 Project Benefits

- The project will improve supply of the High Speed Diesel (HSD), Petrol (MS), in Wardha region and overall benefit the state of Maharashtra which is vital for economic growth as well as improving the quality of life.
- The project shall provide employment potential under unskilled, semi-skilled and skilled categories. The employment potential shall increase with the start of construction activities, reach a peak during construction phase and then reduce with completion of construction activities. During operation phase also there will be employment opportunities, mainly in service sector, although its magnitude will be much less.
- The direct employment opportunities with EOL are limited and the opportunities exist mainly with the contractors and sub-contractors. These agencies will be persuaded to provide the jobs to local persons on a preferential basis wherever feasible.

1.9 Capital Investment

The expected cost of the proposed project will be around Rs. 94 Crores. The capital cost for Environmental management services (EMS) and Pollution control measures (construction and operation phase) will be Rs.173.0 Lakhs.

The cost breakup is as provided in Table 1.6.

Table 1.6: Cost Breakup

S.N	Components	Cost, Rs (in Crores)
1	Basic Engineering	0.62
2	Civil facilities	37.14
3	Mechanical	31.96
4	Electrical	4.45
5	Instrumentation	8.57
6	Fire Fighting	9.53
7	Environmental Protection	1.73
Total		94.00